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Dear Colleagues,

Happy New Year! On December 21, 2020 the U.S. Department of Energy (DOE) released the Energy Storage Grand Challenge (ESGC) Roadmap, the Department's first comprehensive energy storage strategy. This Roadmap includes an aggressive goal: to develop and domestically manufacture energy storage technologies that can meet all U.S. market demands by 2030.

This challenge perfectly coincides with the arrival of Dr. Nœl Bakhtian, the executive director of the newly created Energy Storage Center at Berkeley Lab. Needless to say, the Energy Storage and Distributed Resources Division has a tremendous role to play in this strategic effort which directly draws on our core Science & Technology expertise, developed over the last 40 years and shared by all of our research groups including the newly formed Thermal Energy Group led by Dr. Sumanjeet Kaur.

Below you will find a few notable highlights and recent accomplishments. We look forward to exploring new R&D opportunities in energy storage and other areas with you.

Sincerely,
Robert Kostecki
Division Director, Energy Storage and Distributed Resources

Latest News

Berkeley Lab Energy Storage Center

Last fall, Berkeley Lab named Noël Bakhtian as the executive director of the newly formed Energy Storage Center, a lab-wide center established to advance research to deployment of all types of energy storage, including electrochemical, chemical, thermal, mechanical, flexible loads, and market studies, all in support of the Department of Energy's (DOE's) Energy Storage Grand Challenge.

The Energy Storage Center will draw from the significant capabilities across Berkeley Lab, and Bakhtian has already started forming valuable partnerships with researchers in the Energy Storage & Distributed Resources Division (ESDR).

"ESDR researchers have been incredibly welcoming, and I'm looking forward to working with many of them through the Center," said Bakhtian. "The annual Bay Area Battery Summit took place during my first month, and it was great to jump in and lead a panel with

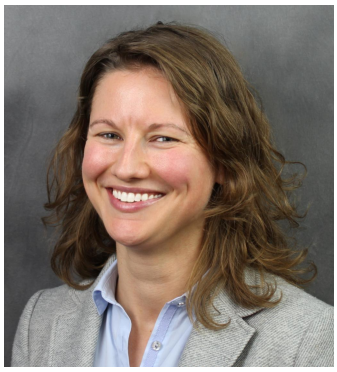
Gao Liu on how DOE National Lab partnerships can accelerate energy storage R&D. We've been holding follow-on meetings with start-ups and other industry organizations who are interested in joining as CalCharge members, and we look forward to hosting the annual Bay Area Battery Summit at Berkeley Lab next year."

Bakhtian highlighted several partnerships that the Energy Storage Center has already formed with ESDR Researchers:

- Sumanjeet Kaur and the newly formed *Thermal Energy Group*, on a multi-lab DOE proposal to take thermal storage systems to the next level.
- Gerd Ceder, *Robert Kostecki*, and *Vince Battaglia*, on the disordered rock salts project which has the potential to replace current nickel- and cadmium-based battery chemistries.
- The *Lithium Resource Research and Innovation Center (LiRRIC)* team, as we're aiming to explore and grow the *Lithium Valley concept*.

Read more about Noël Bakhtian and the Energy Storage Center:
https://newscenter.lbl.gov/2020/10/15/berkeley-lab-names-noel-bakhtian-to-lead-new-energy-storage-center/

New Cyclotron Road Division Director

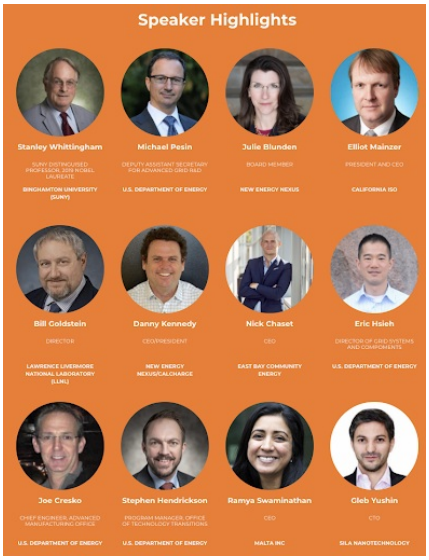


Berkeley Lab has named Rachel Slaybaugh, associate professor of nuclear engineering at UC Berkeley, to lead Berkeley Lab's Cyclotron Road Division. The announcement follows an international search.

Until recently, Slaybaugh served as a program director at the Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E), whose mission is to advance high-potential and high-impact energy technologies. She led programs supporting research in advanced nuclear fission reactors, agriculture technologies, and sensing and data analytics for four years, from 2017 through 2020.

Read more: newscenter.lbl.gov/2021/01/07/rachel-slaybaugh-to-lead-berkeley-labs-cyclotron-road/

Battery Summit Inspires Partnerships



The Bay Area Battery Summit (BABS) just concluded its sixth annual conference, which was held virtually on November 17-18. This year, the two-day conference went beyond batteries and focused on catalyzing collaboration to drive innovation among key players in energy storage.

The summit brought together leading researchers and policymakers, pioneering companies and startups, as well as innovative entrepreneurs and investors to discuss how to implement the U.S. Department of Energy's (DOE's) Energy Storage Grand Challenge (ESGC) and scale technologies from the lab to manufacturing and the marketplace. Three of DOE's Bay Area National Labs have rotated co-hosting BABS each year since 2015, and this year the summit was co-hosted by New Energy Nexus, CalCharge and Lawrence Livermore National Laboratory.

Read more:
https://appliedenergyscience.lbl.gov/news/article/battery-summit-inspires-partnerships

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Dr. Sumanjeet Kaur Announced Leader of New Thermal Energy Group

The Energy Storage & Distributed Resources Division (ESDR) announced the formation of the Thermal Energy Group earlier this month. ESDR now encompasses six groups spanning a diverse set of research areas ranging from energy conversion to grid integration, all of which are part of the Energy Technologies Area (ETA) at Lawrence Berkeley National Laboratory (Berkeley Lab). The group will be led by Sumanjeet Kaur, who has guided and supported the group's innovative research direction and growth over the last several years.

"Sumanjeet Kaur is an obvious choice to lead the new Thermal Energy Group," said Associate Laboratory Director Ravi Prasher. "We have worked together for the past five years, and her brilliance as a scientist and as a mentor to our team members has helped catapult our research lab to the forefront."

Read more: https://appliedenergyscience.lbl.gov/news/article/kaur-leader-new-thermal-energy-group

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Million Mile Fuel Cell Truck Consortia

Hydrogen fuel cells are on the rise: Germany has rolled out hydrogen-powered trains, the San Francisco Bay Area will soon see the nation's first hydrogen fuel cell ferry, and sales of fuel-cell vehicles are up globally. It's a technology with the potential to provide a variety of clean energy options, especially in transportation.

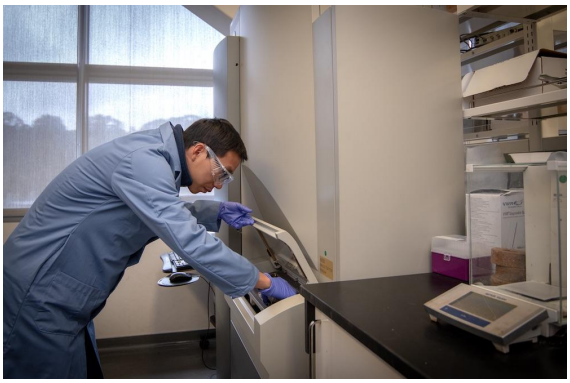
Now the Department of Energy has announced several major investments to take hydrogen fuel cells to the next level, and Lawrence Berkeley National Laboratory (Berkeley Lab) is set to play a leading role in providing the scientific expertise to help realize DOE's ambitious goals.

With funding of $112 million over five years from DOE, subject to appropriations, 10 DOE national labs have been selected to participate in two new consortia and a third continuing one to advance this clean energy technology, improving the durability, lifetime, and efficiency of fuel cells.

Read more: https://newscenter.lbl.gov/2020/10/08/coming-down-the-pike-long-haul-trucks-powered-by-hydrogen-fuel-cells/

New Research Techniques Sheds Light on Least Understood Part of Lithium Batteries

One of the aspects of lithium-ion batteries least understood by scientists has now been elucidated by a new research approach, opening the door to major improvements in battery performance, according to a new study by Berkeley Lab scientists.



Their study, recently published in the journal Joule, used a technique developed by Berkeley Lab battery scientists in the Energy Technologies Area to illustrate the structures of large organic molecules generated during battery operation. These molecules are known to reside in a part of the battery called the solid-electrolyte interphase (SEI) layer, which is poorly understood but has a critical impact on battery performance.

"The findings reveal a new dimension of chemical composition inside lithium-ion batteries and enables a new direction for rational engineering of the battery's electrolyte system," said lead author Chen Fang, a postdoctoral researcher in Berkeley Lab's Energy Technologies Area.

Read more: https://newscenter.lbl.gov/2021/01/14/new-research-technique-sheds-light-on-least-understood-part-of-lithium-batteries/

Energy Storage and Distributed Resources

Energy Technologies Area | Berkeley Lab

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Energy Storage and Distributed Resources

Lawrence Berkeley National Lab (Berkeley Lab) is located in the Berkeley Hills near UC Berkeley and conducts scientific research on behalf of the United States Department of Energy (DOE). It is managed and operated by the University of California (UC). The Laboratory overlooks the University of California, Berkeley.

Berkeley Lab addresses the world's most urgent scientific challenges by advancing sustainable energy, protecting human health, creating new materials, and revealing the origin and fate of the universe. Founded in 1931, Berkeley Lab's scientific expertise has been recognized with 13 Nobel prizes. The University of California manages Berkeley Lab for the U.S. Department of Energy's Office of Science. For more information, visit www.lbl.gov.

DOE's Office of Science is the single largest supporter of basic research in the physical sciences in the United States, and is working to address some of the most pressing challenges of our time. For more information, see science.energy.gov.